REMARKS

Upon entry of this paper, claims 1-3 and 5-11 are pending, of which claims 1 and 6 are independent. Claims 1, 3, 6 and 8-10 are amended. Support for the amendments can be found at least at page 25, lines 16-23; page 27, lines 6-8 and Figures 3-7 of the Present Application. No new matter is added. Applicants respectfully submit that the pending claims define over the art of record.

I. Interview with the Examiner

Applicants thank the Examiner for the courtesy of extending an interview on March 17, 2009. During the interview, Applicants' representatives discussed proposed claim amendment to claims 1 and 6. Specifically, regarding proposed amendments to claim 1, the Examiner inquired about the term *interface*. Applicants' representatives explained to the Examiner that the term defines the common boundary area of the buffer and the flow grooves. Applicants' representatives also explained the term referring to the Figures of the Present Application, such as Figure 7. Applicants' representatives indicated to the Examiner that the buffers 98 and 100 have a side 98b and 100b, respectively, that *interfaces* with the reactant gas flow field 96. Applicants' representatives also explained that the sides 98b and 100b are perpendicular to the terminal portions of the serpentine grooves 102a-102c. Applicants amend claim 1 as discussed during the interview. Applicants further amend 1 to clarify the structure of the inlet and outlet buffers.

Regarding claim 6, the Examiner indicated that the current claim language is confusing since it is not clear how a buffer can have one side connected to a reactant gas flow field *on one side* of the separator, while being connected to the coolant flow field on the *other side* of the separator. Applicants' representatives referred the Examiner to Figures 1 and 4 and page 27, lines 6-12 of the Specification. As explained in this section, the inlet buffer formed on a surface of the metal separator overlaps with the outlet buffer formed on an opposite surface of the separator so as to form a "single" buffer. Applicants amend claim 6 as illustrated above to address the Examiner's concerns.

II. Objection to the Specification

The Examiner deems that the title of the invention is not descriptive. The Examiner requires a new title that is clearly indicative of the invention to which the claims are directed.

Applicants amend the title of the invention as "Fuel Cell with Triangular Buffers." Applicants believe that the amended title addresses the Examiner's concerns. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the objection to the title of the invention.

III. Rejection of Claims under 35 U.S.C. § 103

Claims 1, 2, 5-7, 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2001/0044042 by Inoue et al. (hereafter "Inoue") in view of Japanese Patent Application Publication No. JP 2000-164230 by Sha et al. (hereafter "Sha").

Claims 3 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue reference and the Sha reference and further in view of U.S. Patent No. 5,077,148 to Schora et al. (hereafter "Schora").

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue reference and the Sha reference further in view of Japanese Patent Application Publication No. JP 10-106594 by Kurita et al. (hereafter "Kurita").

Claim 1

The Examiner recognizes that the Inoue reference does not disclose that *one side of the inlet buffer and one side of the outlet buffer are substantially perpendicular to the terminal portions of the serpentine flow grooves*. *See* Office Action, page 6, § 3. The Examiner asserts that the Sha reference may be interpreted to teach this claim feature. Specifically, the Examiner provides a figure on page 8 of the Office Action to illustrate his interpretation. The Examiner asserts that the terminal portions of the Sha reference all face in the direction of arrow A which

is substantially perpendicular to the side B of the flow groove of the Sha reference. *See* Office Action, page 8.

Contrary to the Examiner's interpretation, the Present Application refers to the straight side of the triangular inlet and the triangular outlet buffer that faces the end portions of the serpentine grooves. Accordingly, Applicants amend claim 1 to clarify the structure of the triangular buffers with respect to the reactant gas supply and discharge passages.

Amended claim 1 recites that *each of the inlet buffer and the outlet buffer has a third side that is oblique to the one side of each of the inlet buffer and the outlet buffer, the third oblique side of each of the inlet buffer and the outlet buffer is substantially parallel to one side of each of the reactant gas supply passage and the reactant gas discharge passage. See* Figures 3-7.

As illustrated in Figure 7 of the Present Application, the vertical section 98b of the inlet buffer 98 and the vertical section 100b of the outlet buffer 100 are substantially perpendicular to the terminal portions of the fuel gas flow grooves 102a through 102c. This configuration results in the fuel gas smoothly flowing from the inlet buffer 98 into the fuel gas flow grooves 102a through 102c, and flowing out of the fuel gas flow grooves 102a through 102c to the outlet buffer 100. *See* Specification, page 25, lines 16-23 and Figure 7.

The Sha reference, alone or in any reasonable combination with the Inoue reference, does not teach or suggest this claim feature. Specifically, fallowing the Examiner's interpretation of the Sha reference illustrated on page 8 of the Office Action, the oblique side of the buffer is <u>not</u> parallel to one side of the reactant gas passage. Rather, in the Sha reference, the side of the buffer that is parallel to the reactant gas passage is straight, as opposed to being oblique.

Amended claim 1 further recites that *each of the inlet buffer and the outlet buffer has a first side that forms an interface with terminal portions of the serpentine flow grooves, the first side of each of the inlet buffer and the outlet buffer is substantially perpendicular to the terminal portions of the serpentine flow grooves. See* Figures 3-7.

As provided above in the Interview with the Examiner section, the term "interface" defines the common boundary area of the buffer and the flow grooves. As illustrated in Figure 7

of the Present Application, the buffers 98 and 100 have a side 98b and 100b, respectively, that *interfaces* with, i.e. defines a common boundary area with, the reactant gas flow field 96. As further illustrated in Figure 7, the sides 98b and 100b that interface with the reactant gas flow field 96 are perpendicular to the terminal portions of the serpentine grooves 102a-102c.

In contrast, in the Sha reference, the side of the buffer that interfaces with the reactant gas flow field is *parallel,* as opposed to being substantially perpendicular, to the terminal portions of the flow grooves. As such, the Sha reference, alone or in any reasonable combination with the Inoue reference, does not teach or suggest this claim feature.

Furthermore, amended claim 1 also recites that *the reactant gas supply passage and the reactant gas discharge passage are positioned on extensions of the respective terminal portions of the serpentine flow grooves. See* Figures 3-7. Because of this feature, it is possible for the claimed invention to smoothly supply the reactant gas from the reactant gas supply passage to the reactant gas flow field, and smoothly discharge the reactant gas from the reactant gas flow field to the reactant gas discharge passage, without turbulence. As a result, uniform distribution of the reactant gas can be achieved. In contrast, in the Sha reference, the reactant gas supplied from the reactant gas supply passage needs to change its flow direction at the buffer area. Such structure does not achieve smooth flow of the reactant gas. As such, the Sha reference, alone or in any reasonable combination with the Inoue reference, further fails to teach or suggest this feature of claim 1.

In addition, Applicants' claim 1 further recites that *the inlet buffer* (98) *and the outlet buffer* (100) *has a substantially triangular shape. See* Figure 7. Thus, the area of the inlet buffer 98 and the area of the outlet buffer 100 are small in comparison to conventional rectangular buffers, such as those illustrated in the Inoue reference. As a result, the space needed for the inlet buffer 98 and the outlet buffer 100 is reduced significantly. Consequently, while achieving the above mentioned results, the claimed invention makes it possible to downsize the separator 13.

In light of the arguments presented above, Applicants respectfully submit that the combination of the cited references does not teach or suggest each and every element of amended claim 1.

Claim 6

Applicants amend claim 6 to clarify the structure of a single buffer. Amended claim 6 recites that *the metal separator includes a first triangular buffer formed on a first surface of the separator and a second triangular buffer formed on a second opposite surface of the separator, wherein the first substantially triangular buffer and the second substantially triangular buffer overlap to form a single substantially triangular buffer. See* Specification, page 27, lines 6-8 and Figures 3 and 7. Claim 6 further recites that the single buffer *has one side connected to the reactant gas supply passage on the one surface of the metal separator, and another side connected to the coolant passage on the other side of the metal separator, and a still another side connected to the reactant gas flow field and the coolant flow field on both surfaces of the metal separator.* The combination of the Inoue and Sha references does not teach or suggest this claim feature.

The Examiner asserts that the Inoue reference teaches a buffer having one side connected to reactant gas supply passage on the one surface of the metal separator and another side connected to the coolant passage on the other side of the metal separator, and still another side connected to the reactant gas flow field and the coolant flow field on both surfaces of the metal separator. *See* Office Action, page 4. The cited sections of the Inoue reference teaches a gas flow field (60) formed on one surface (16a) and a coolant flow field (72a and 72b) is formed on the other surface (16b) of the separator. *See* Figures 2, 5, ¶ [0042], [0044].

However, the Inoue reference is silent about different sides of the same buffer being connected to the reactant gas supply passage, the reactant gas flow field, the coolant supply passage and the coolant flow field. The Inoue reference teaches a gas flow field formed on one surface and a coolant flow field formed on the other surface of the separator. However, the Inoue reference, alone or in any reasonable combination with the Sha reference, does not teach or suggest a single buffer formed on the separator and the connection between the sides of the buffer and the flow fields. As such, the Inoue reference, alone or in combination with the cited references, does not teach or suggest each and every element of amended claim 6.

Claims 2, 3 and 5 depend from claim 1. Claims 7-11 depend from claim 6. Dependent claims incorporate each and every element of the independent claim upon which they depend. In

light of the arguments presented above, Applicants respectfully submit that the cited references reference does not disclose each and every element of independent claims 1 and 6, thus claims 2, 3, 5 and 7-11.

Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of claims 1-3, 5 and 6-11 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. TOW-099USRCE. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

Dated: May 22, 2009

Respectfully submitted,

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